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ABSTRACT

This evaluation examines the progress made in the areas of achievement and enrollment by students at the Central Middle Magnet School in the Kansas City, Missouri, School District after the Computers Unlimited program had been in operation for 4 years. The evaluation design used data on student demographics gathered from the Research Office of the Kansas City, Missouri, School District (KCMSD) and from the Central Middle School administrators. Analysis of co-variance was used to determine whether Central Middle computer students scored statistically significantly higher on the Iowa Tests of Basic Skills (ITBS) than a random selection of students from other district middle schools. A student cohort made up of students who had attended the school from 1989-1991 and who were in grades six, seven and eight in those respective years, was also examined and broken down by minority/non-minority status. It was found that results on both enrollment and achievement are mixed, but overall, when compared with the baseline year of 1986-87, there are signs of definite improvement in both areas. Four tables and three figures display the results of data analyses. (ALF)

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Achievement and Enrollment Evaluation of the Central Computers Unlimited Magnet Middle School

1990-1991

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March 1992

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ACHIEVEMENT AND ENROLLMENT REPORT OF THE CENTRAL COMPUTERS UNLIMITED MIDDLE MAGNET SCHOOL

1987-1991

Introduction

This evaluation examines the progress made by the Central Middle Magnet School after four years of implementing the Computers Unlimited theme. According to the *Long-Range Magnet School Plan* (Hale & Levine, 1986), there should be two years of formative evaluation before a summative evaiuation is done in year three. After the third year, achievement and enrollment will be reported for years four and five with a summative report to follow in year six. Central Middle School having completed its fourth year, achievement and enrollment will be presented for this report.

Program Description

Central Middle was designated a computer magnet school in the *Long Range Magnet School Plan* (Hale & Levine, 1986). Year I of magnet implementation took place during the 1987-1988 school year at the Seven Oaks building with seventh and eighth grade students. During Year I the Central Middle building was renovated for computer installation and asbestos removal. Students and staff returned "home" for the 1988-1989 school year and found a building that was ready for computers and students, though contractors continued with finish work for the remainder of the semester. By year-end, classroom construction and coordination of student services were completed. The installation of the communications network to link the computers was not completed until Year II when, after many problems, a new contractor was hired to install the network. The network connects computers from math, computer, and science labs.

An inventory in fall 1990 revealed that computers are installed throughout the building, in virtually every classroom, and in the library, administrative offices and teacher planning rooms. There are approximately 370 computers at Central Middle including models by IBM, Tandy, AT&T, Apple, CCC and Everex. This was an increase of 110 computers over 1989-90.

A second theme, foreign language, was first implemented at Central Middle School in Fall 1988. Theoretically, each magnet theme is evaluated entirely on its own. The building

administrators, however, have one school to run and two themes to integrate. There is inevitably some overlap. For example, foreign language magnet students at Central attend the computer math labs on the same schedule as all other classes do. Math and science classes in the core curriculum use computers as instructional tools and computer magnet students may enroll in language courses as electives. In that first dual theme year students were not tagged by theme in the student data base, making the reporting of enrollment and achievement by theme impossible. Tables throughout this report omit data for the 1988-89 school year.

Year III of the computer theme's implementation at Central Middle, 1989-90, saw the eighth graders complete only their second year of computer instruction because of the grade level restrictions during Year I at Seven Oaks. The class which entered eighth grade in the fall of 1990 was the first cohort to have computers for their entire middle school experience.

Evaluation Design

Data for this report were gathered from several sources. The Research Office of KCMSD provided data on student demographics. Additional information on magnet student enrollment was provided by Central Middle administrators. Where data is available, enrollment and achievement are reported for the first four years of the program and the baseline year preceding implementation. Problems arose when the second theme was implemented in 1988 and students were not clearly tagged by theme. Notation is made of incomplete data in those sections of the report affected. Achievement scores are presented across the four years of implementation, again when students in the theme could be identified. Analysis of co-variance was used to determine whether Central Middle computer students scored statistically significantly higher on achievement tests as compared to a random selection of students from other district middle schools. A student cohort made up of students who attended the school in 1988-89, 1989-90, and 1990-91 and who were in grades six, seven, and eight in those respective years was also examined broken down by minority/non-minority status. These data are presented in graph form in figures in the appendix.

Results

Student Demographics

Table 1 reports, for each grade level, the Computers Unlimited program capacity at Central Middle School as used by the district Admissions Office for student placement, the actual

Table 1

Enrollment and Program Capacity by Grade
Central Computers Unlimited Magnet Middle School
1990 - 1991

Grade	Program[1] Capacity	Actual[2] Enrollment	Difference N	Percent of Capacity
Sixth	150	149	- 1	99%
Seventh	150	137	-13	91%
Eighth	131	111	-20	78%
Total	431	397	-34	92%

Note: Percentages are rounded to the nearest whole percent.

1 Program capacity used by the admissions office when placing students in magnet programs.

2 From *September 26, 1990 Student Membership* (KCMSD Research Office, 1990)

enrollment as reported by the district Research Office, the difference between the two figures, and the percent of the capacity that was filled. Overall, the program was filled to 92% of capacity, which translates to 34 students under the recommended capacity number. Sixth grade was one student under capacity, translating to 99% of capacity. Seventh grade was 13 students under capacity and eighth grade was 20 students under capacity, translating to 91% and 78% of capacity, respectively, for those grade levels.

Table 2 shows enrollment and racial balance for Central Middle Computers Unlimited for 1987-91. Total enrollment was lower during the 1987-88 school year when the school was in temporary quarters at Seven Oaks. Prior to becoming a magnet school, Central was a junior high with a non-minority enrollment of 1%. During Year I of Computers Unlimited implementation, total school non-minority enrollment jumped to 15% and by Year IV it climbed to 31%, showing a trend toward desegregation and movement overall toward the 60% minority/40% non-minority goal.

Sixth and seventh grades remained relatively stable proportionally between 1989 and 1990, with 68% and 69% minority respectively in sixth grade and 74% and 75% minority respectively in seventh grade. It should be pointed out here the role placement plays in the determination of the enrollment percents. The number of minority and non-minority students desiring admittance to the program and the availability of seats are both factors to be considered in addition to the desired movement toward the 60/40 proportion goal when placement decisions

Table 2

Central Computers Unlimited Magnet Middle School Enrollment by Grade Level

Groups	Baseline 1986-87 N	%	Year 1 1987-88 N	%	Year 3 1989-90 N	%	Year 4 1990-91 N	%
Total Enrollment	508		323		367		397	
Minority	505	99%	274	85%	263	72%	273	69%
Non-Minority	3	1%	48	15%	104	28%	124	31%
6th Grade Enrollment	---	---	---	---	128	---	149	---
Minority	---	---	---	---	87	68%	103	69%
Non-Minority	---	---	---	---	41	32%	46	31%
7th Grade Enrollment	250	---	128		118	---	137	---
Minority	247	99%	94	73%	87	74%	102	75%
Non-Minority	3	1%	34	27%	31	26%	35	25%
8th Grade Enrollment	258	---	195	---	121	---	111	---
Minority	258	100%	181	93%	89	74%	68	61%
Non-Minority	0	0%	14	7%	32	26%	43	39%

Note: Enrollment figures provided by KCMSD Research Office. Enrollment figures for Year II, 1988-89, are not presented because a second theme began and students were not tagged by theme for separation.

are made. Placement of students to make a 2% increment toward the 60/40 goal allows a maximum number of minority students to be admitted to the program of their choice. However, last minute student attrition due to patrons' changed decisions, moving residence, etc. sometimes can affect the proportions enough to make those small increments disappear. These changes are not under the control of the placement office and can sometimes change the expected outcomes of the best laid plans and projections. The placement office reviews the enrollment in each program and grade level in early October and again in January at semster, moving students when possible in an attempt to adjust the ratios to the desired enrollment goal. Since placement is done to meet the minimal two percent increment toward the 60/40 goal, late summer and fall attrition probably affected the final figures at both sixth and seventh grades. Table two's enrollment figures reflect the result of this attrition and do not reflect the Placement office enrollment adjustments made in October.

Examination of eighth grade enrollment trends shows a different pattern. Enrollment numbers since 1986-87 decline for minority students and increase for non-minority students each year. The percent of non-minority students at 8th grade increases each year from 0% in fall 1987 to 39% in fall 1990. Referral back to the program capacity for each grade level, presented in Table 1, reveals that the eighth grade in 1990-91 is only filled to 78% capacity. The jump from 26% non-minority in fall 1989 to 39% non-minority in fall 1990 was in part due to increased numbers of non-minority students and in part due to decreased numbers of minority students. This could be explained by an overall lack of applications, especially by minority students, making it impossible to come closer to the program's enrollment capacity or by an unexpected high attrition rate among the previous year's minority students. If attrition is the cause, then reasons for students non-return should be investigated.

Achievement

It is important to note that while improvement in academic achievement is an objective for all educational programs, simplistic reporting of test scores on a school-by-school basis often underestimates the effectiveness of magnet schools to improve educational quality and equality (Hale & Levine, 1986). Therefore, it is recommended that these scores be used in context with other measures when judging the effectiveness of the computer theme.

ITBS. A summary of testing data from springs of 1987, 1988, 1990 and 1991 Iowa Tests of Basic Skills (ITBS) is presented in Table 3. Reading, language and math scores for students in the Central Middle School Computers Unlimited theme are presented as percentile ranks converted from mean grade equivalents. Scores are broken down by grade level and minority/non-minority status. It is important to note here that scores for 1987, the baseline year, are for total enrollment. Scores for 1988 are also for total enrollment as there was only the one theme. No scores are presented for 1989 because a second theme was added that year and students were not tagged by theme in the testing data base and thus could not be separated. The 1990 and 1991 scores are presented for Central Middle Students enrolled in the Computers Unlimited theme. In 1991, scores at sixth grade declined across all subjects, down six percentile points in language (44th to 38th percentile rank), eight percentile points in math (39th to 31st percentile rank), and nine percentile points in reading (43rd to 34th percentile points). Scores at seventh grade remained relatively stable in reading (remaining at the 39th percentile rank) and in math (rising from 37th to 39th percentile rank). Seventh grade language scores rose from the 39th to the 43rd percentile rank, the largest gain across grade levels and

Table 3

Central Computers Unlimited Magnet Middle School

Iowa Tests of Basic Skills (ITBS)Scores Presented as Percentile Ranks

1987-1991

Grade	Baseline			Year 1			Year 3			Year 4		
	1986-87			1987-88			1989-90			1990-91		
Subject	Min	N/Min	Total	Min	N/Min	Total	Min	N/Min	Total	Min	N/Min	Total
Sixth												
Reading	---	---	---	---	---	---	38	54	43	30	44	34
Math	---	---	---	---	---	---	34	49	39	26	42	31
Language	---	---	---	---	---	---	42	48	44	35	46	38
Seventh												
Reading	25	**	25	38	51	41	31	58	39	35	54	39
Math	40	**	40	40	53	44	29	59	37	35	53	39
Language	39	**	39	43	57	47	33	54	39	41	48	43
Eighth												
Reading	22	---	22	29	44*	29	40	46	42	39	53	44
Math	34	**	34	28	50*	29	40	47	42	32	52	39
Language	36	**	36	37	43*	37	44	45	45	42	52	45

Note:: Scores are not presented for 1988-89 because the test files were not coded for separation by theme.

* Based on fewer than ten students.

** No scores are presented because fewer than four students were involved.

subjects. Scores in eighth grade reading, math, and language remained relatively stable with a two point increase in reading (42nd to 44th percentile rank), a three percent decline in math (42nd to 39th percentile rank), and no change in language (both years at 45th percentile rank). There were no sixth graders at Central in 1987 or 1988, but looking at differences in scores since the 1987 baseline year, increases are noted in almost every content area across grades seven and eight. Changes at seventh grade ranged from a drop of one percentile point in seventh grade math (40th to 39th percentile rank) to increases of four percentile points in language (39th to 43rd percentile rank) to 14 percentile points in reading (25th to 39th percentile rank). Eighth grade scores improved across subjects rising five percentile points in math (34th to 39th percentile rank), nine percentile points in language (36th to 45th percentile rank), and 22 percentile points in reading (22nd to 44th percentile rank). Looking across grade

levels, reading showed the most dramatic improvement with increases of 14 and 22 percentile points.

The table reveals that non-minority student scores were higher than those of minority students across all subjects and grade levels. A more detailed look at the differences between the two groups can be seen through examination of a sixth grade cohort which follows the same students from sixth grade in 1989 to eighth grade in 1991. These data, shown on Figures one through three in the Appendix, reveal that while the non-minority students' scores were higher, the pattern of gain over time was similar for both the minority and non-minority students across subjects. Students in the cohort tended to remain relatively stable in math and language with the only real gains made in reading. Minority students had an eight percentile point raise (33rd to 41st percentile from sixth to eighth grade) while non-minority students' scores rose 11 percentile points (67th to 78th percentile from sixth to eighth grade).

In order to compare achievement scores of Central students to other district students, a random sample of Central and district middle school students was obtained. Results of these comparisons are displayed in Table 4. Analysis of co-variance was used to analyze 1991 ITBS reading, language and math scores using students' sixth grade cognitive abilities scores as covariates. The adjusted mean scores are derived from the expected mean grade equivalents on the ITBS tests after pre-test differences between the two groups have been removed using the covariates. This type of adjustment makes it possible to compare the scores of two or more groups even though the scores might not have been equivalent before the groups participated in different programs. Tests were repeated on three samples to insure results were representative and not just due to sampling error. These mean adjusted and non-adjusted scores were converted to percentile ranks for presentation in the table. It can be seen from the table that, after adjusting for preexisting differences, Central students scored statistically significantly higher at the .05 significance level on seventh grade reading and eighth grade math.

Conclusions

Results on both enrollment and achievement for Central Middle School Computers Unlimited are mixed. Overall, when compared with the baseline year of 1986-87, before the theme was implemented there are signs of definite improvement in both areas. Minority enrollment went from 99% in 1986-87 to 69% in 1990-91. Changes are not consistent across

Table 4

Comparison of 1991 ITBS Reading, Math, and Language Scores for Randomly Selected Students at Central Computers Unlimited Middle School Magnet and Other District Middle Schools

Test Grade Means	Central Middle School Percentile Rank	Comparison Group Percentile Rank	Probability Level
Reading			
Grade 1			
Grade 6			
Unadjusted mean	33	28	
Adjusted mean	30	31	.79
Grade 7			
Unadjusted mean	40	33	
Adjusted mean	41	32	.02*
Grade 8			
Unadjusted mean	46	40	
Adjusted mean	45	41	.37
Math			
Grade 6			
Unadjusted mean	31	30	
Adjusted Mean	29	32	.29
Grade 7			
Unadjusted mean	39	34	
Adjusted mean	40	33	.14
Grade 8			
Unadjusted mean	41	30	
Adjusted mean	40	31	.02*

Table 4 (continued)

Comparison of 1991 ITBS Reading, Math and Language Scores for Students at Central Middle School Computer Magnet and Randomly Selected Middle Schools

Test Grade Means	Central Middle School Percentile Rank	Comparison Group Percentile Rank	Probability Level
Language			
Grade 6			
Unadjusted mean	38	36	
Adjusted Mean	36	39	.28
Grade 7			
Unadjusted mean	45	46	
Adjusted mean	45	45	.89
Grade 8			
Unadjusted mean	47	48	
Adjusted Mean	46	48	.52

Note: Analysis of Covarience was used to compare Central Middle School Computer Magnet Students with a random sample of middle school students in other schools. Sixth grade cognitive abilities scores were used as covariates.

* Statistically significant at the .05 level

grade levels however and the effects of recruitment and placement cannot be sorted out from the attraction of the magnet theme based on the current data that is available.

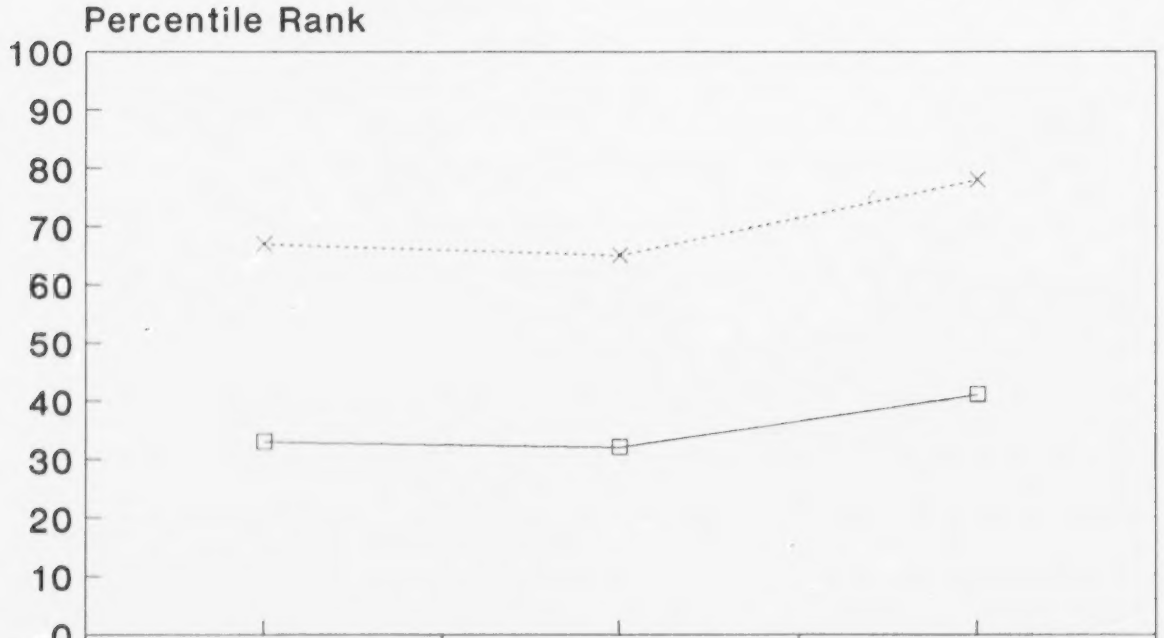
Achievement scores are higher for the most part in 1991 than before theme implementation. The greatest gains are in reading, with seventh and eighth grade student percentile ranks increasing 14 and 22 percentile points respectively. While overall the trend is for increased scores, changes from year to year and across grade levels have not been consistent over the time period since implementation of the theme.

References

Hale, P. D. & Levine, D. U. (1986). *Long Range Magnet School Plan*. Kansas City, MO: Kansas City, Missouri School District.

Figure 1

ITBS Reading Achievement Across Time: 1989 Sixth Grade Cohort

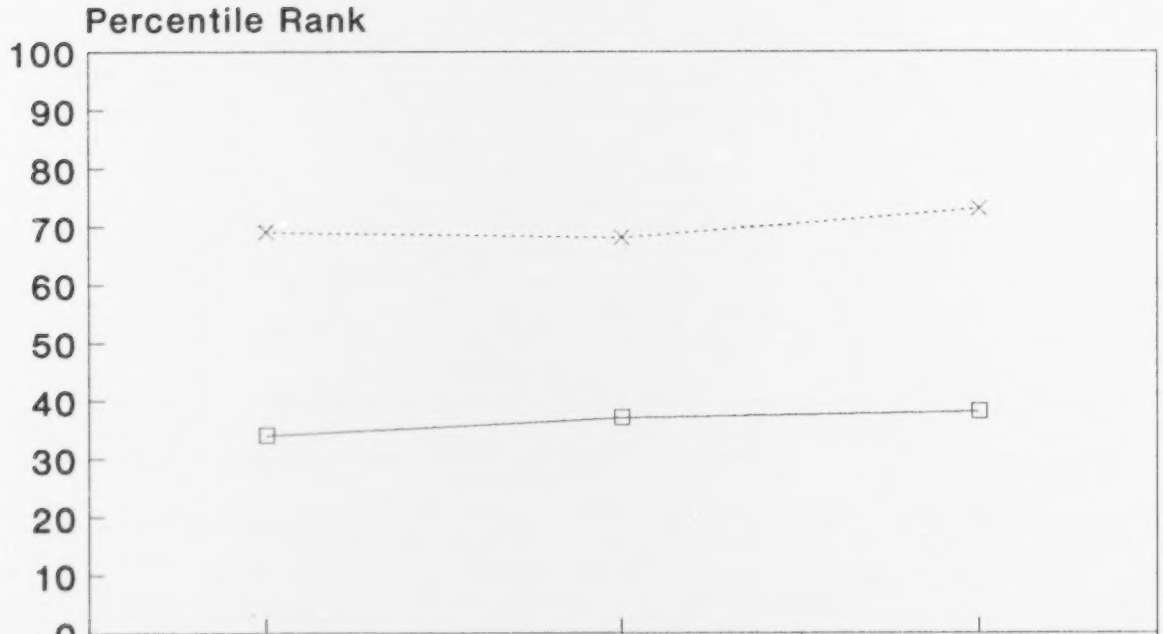


	Sixth Grade	Seventh Grade	Eighth Grade
Minority	33	32	41
Non-Min.	67	65	78

Note: Percentile ranks were converted from mean grade equivalent scores

Central Computers-Unlimited Middle School

Figure 2
ITBS Math Achievement Across Time: 1989 Sixth Grade Cohort

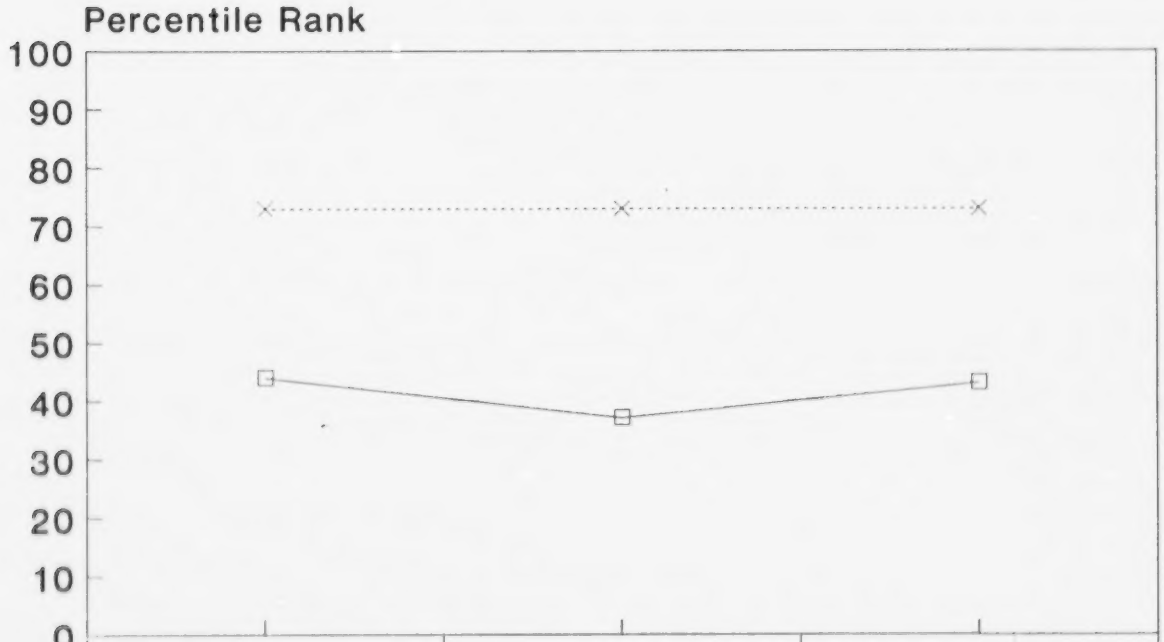


	Sixth Grade	Seventh Grade	Eighth Grade
Minority	34	37	38
Non-Min.	69	68	73

Note: Percentile ranks were converted from mean grade equivalent scores
Central Computers-Unlimited Middle School

Figure 3

ITBS Language Achievement Across Time: 1989 Sixth Grade Cohort



	Sixth Grade	Seventh Grade	Eighth Grade
Minority	44	37	43
Non-Min.	73	73	73

Note: Percntile ranks were converted from mean grade equivalent scores

Central Computers-Unlimited Middle School